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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/635,557	08/07/2003	Kouichi Shimizu	NS-US035060	8602

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EXAMINER

VANAMAN, FRANK BENNETT

ART UNIT	PAPER NUMBER
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3618

DATE MAILED: 11/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/635,557

Applicant(s)

SHIMIZU ET AL.

Examiner

Frank Vanaman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-105 is/are pending in the application.
- 4a) Of the above claim(s) See Continuation Sheet is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 12, 22, 24, 25, 29, 33-36, 45, 57, 58, 62, 67-73, 82, 92, 94, 95, 99 and 103-105 is/are rejected.
- 7) ☒ Claim(s) 5, 8-10, 13, 14, 18-21, 23, 37, 38, 41-43, 46, 47, 51-55, 66, 74, 75, 78-80, 83, 84 and 88-92 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>12/5/03</u> . | 6) <input type="checkbox"/> Other: _____ |

Continuation of Disposition of Claims: Claims withdrawn from consideration are 6,7,11,15-17,23,26-28,30-32,39,40,44,48-50,56,59-61,63-65,76,77,81,85-87,93,96-98 and 100-102.

Election/Restrictions

1. Applicant's election without traverse of Species I in the reply filed on June 14, 2005 is acknowledged.

Applicant has identified claims 1-5, 8-10, 12-14, 18-22, 24, 25, 29, 33-38, 41-43, 45-47, 51-55, 57, 58, 62, 66-75, 78-80, 82-84, 88-92, 94, 95, 99 and 103-105 as being directed to the elected species, with claims 6-7, 11, 15-17, 23, 26-28, 30-32, 39, 40, 44, 48-50, 56, 59-61, 63-65, 76, 77, 81, 85-87, 93, 96-98 and 100-102 being withdrawn from consideration at this time.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

4. Claims 2, 14, 25, 29, 33, 35, 47, 62, 66, 72, 84, 99 and 103 are objected to because of the following informalities: in claim 2, line 3, claim 35, line 3, and claim 72, line 3, "is substantially equals" is informal; in claim 25, line 6, it appears as though a word may be missing between "of" and "power source"; in claims 14, 47 and 84 at lines 11-12, and in claims 29, 33, 62, 66, 99 and 103 at line 4, "indicating cease the drive torque" is informal. Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. Claims 12, 22, 45, 82 and 92 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the

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subject matter which applicant regards as the invention. In claims 12, 45 and 82, the recitation of setting a drive torque "on a generation capacity" is not entirely clear; in claims 22 and 92, "the predetermined field current value" (last line of each claim) appears to lack a clear antecedent basis.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-3, 34-36, 104 and 105 are rejected under 35 U.S.C. 102(b) as being anticipated by Eguchi (US 6,371,883). Eguchi teaches a vehicle driving force arrangement for a vehicle having a wheel (col. 3, lines 44-45) and drive sources including an engine (E) and a motor (M) for providing drive torque, and a clutch (5) in the torque path, including a transition determining means (process steps 1-7, 10, 11) which outputs a transition determination ("Yes" at step 7) indicating an imminent cease of drive torque from a source, and a section for releasing the clutch (process steps 20-36) which causes a disengagement of the clutch at a time when the torque across the clutch (difference between output and input) becomes zero (steps 22, 23), subsequent to a determination of the transition, the system including a drive source output control (broadly steps 50-54) which control the source's output in shutting it off, in response to the determination of transition.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 24, 29, 33, 57 and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eguchi (cited above). While the reference to Eguchi as discussed above teaches the use of torque information to control release of the clutch, the reference fails to teach the specific determination of the decrease of the drive source torque or value of the drive source torque in the transition determination. It is very well known to use torque values in determining connection or disconnection of a torque-transmitting member in a vehicle construction, and as such, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a drive source torque value in the determination of transition to ensure that a transitional mode is not initiated when high torque driving is occurring, thus preventing sudden changes in vehicle motion.

As regards claims 24 and 57, the reference to Eguchi whilst teaching the use of an electric motor (M) to deliver torque for driving, fails to explicitly teach the control of the field current to control the motor. Inasmuch as the adjustment of field current in motor control is very well known (e.g., in non-multi-phase motors), it would have been obvious to one of ordinary skill in the art at the time of the invention to control the motor output of the motor already taught by Eguchi by field current so as to provide accurate control of a non-multi-phase motor.

10. Claims 4, 25 and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eguchi in view of Maruyama (US 6,533,701). The reference to Eguchi is discussed above and fails to teach the maintenance of a drive torque at a value during a delay period after a clutch release is commanded. Maruyama teaches that there is a delay between initiation of a clutch command (t_0 , figures 5) and the beginning of disengagement (figure 5B, between t_0 and t_1); wherein a commanded operating torque (e.g., motor torque at 5G and/or engine torque at 5D) is maintained at a target value for a delay period (i.e., between t_0 and t_1). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide a delay in the commanding of a change in the torque of the drive source of the vehicle of Eguchi, as suggested by

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Maruyama, for the purpose of accommodating the delay in actuation of the clutch after the actuation is commanded, so as not to change the drive torque until the clutch actuation commences.

As regards claims 25 and 58, the reference to Eguchi as modified by Maruyama, whilst teaching the use of an electric motor (M) to deliver torque for driving, fails to explicitly teach the control of the field current to control the motor. Inasmuch as the adjustment of field current in motor control is very well known (e.g., in non-multi-phase motors), it would have been obvious to one of ordinary skill in the art at the time of the invention to control the motor output of the motor already taught by Eguchi by field current so as to provide accurate control of a non-multi-phase motor.

11. Claims 67-73, 94, 95, 99 and 103 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eguchi in view of Shimasaki et al. (US 6,578,649). The reference to Eguchi is discussed above and fails to teach the provision of non-all wheel drive and multi-wheel drive modes, wherein the non all wheel drive is characterized by a disengagement of the clutch, and wherein the drive modes may be selected, further including a slippage detection section which allows selection of the drive mode based on slippage determination. Shimasaki et al. teach a drive scheme for a vehicle wherein a multi-wheel or non-all wheel drive mode may be selected by at least a slip determination (figure 3), the arrangement including a pair of wheels (7) driven by motors (8) and a pair of wheels (1) driven by an engine, the motor being powered from a battery (11, 13) or a generator (6). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the motor and engine taught by Eguchi to drive separate wheel systems as taught by Shimasaki et al., so as to increase the traction capabilities of the vehicle. While the modifying reference to Shimasaki et al. fails to specifically teach the use of a clutch in association with the separate electric motor drives, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a clutch for each driving source (engine, electric motor) as set forth in the combination (note that Eguchi already teaches the use of at least one clutch) for the purpose of reducing drag when any of the sources are not driving the vehicle.

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As further regards claims 94 and 95, the reference to Eguchi as modified by Shimasaki et al., whilst teaching the use of an electric motor (M) to deliver torque for driving, fails to explicitly teach the control of the field current to control the motor. Inasmuch as the adjustment of field current in motor control is very well known (e.g., in non-multi-phase motors), it would have been obvious to one of ordinary skill in the art at the time of the invention to control the motor output of the motor already taught by Eguchi by field current so as to provide accurate control of a non-multi-phase motor.

As further regards claim 99 and 103, while the reference to Eguchi as modified by Shimasaki et al. teaches the use of torque information to control release of the clutch, the reference fails to teach the specific determination of the decrease of the drive source torque or value of the drive source torque in the transition determination. It is very well known to use torque values in determining connection or disconnection of a torque-transmitting member in a vehicle construction, and as such, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a drive source torque value in the determination of transition to ensure that a transitional mode is not initiated when high torque driving is occurring, thus preventing sudden changes in vehicle motion.

Allowable Subject Matter

12. Claims 5, 8, 9, 10, 13, 14, 18-21, 23, 37, 38, 41-43, 46, 47, 51-55, 66, 74, 75, 78-80, 83, 84 and 88-92 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

13. Claims 12, 22, 45, 82 and 92 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

14. Note that claims 6-7, 11, 15-17, 23, 26-28, 30-32, 39, 40, 44, 48-50, 56, 59-61, 63-65, 76, 77, 81, 85-87, 93, 96-98 and 100-102 are currently withdrawn from consideration.

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Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Fields et al. (US 4,351,405), Kenyon (US 4,438,342), Gardner (US 5,301,764), Arai et al. (US 6,008,606), Nagano et al. (US 6,059,064), Tabata (US 6,540,642), and Amanuna et al. (US 6,767,310) teach vehicle drives of pertinence.

16. Any inquiry specifically concerning this communication or earlier communications from the examiner should be directed to F. Vanaman whose telephone number is 571-272-6701.

Any inquiries of a general nature or relating to the status of this application may be made through either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

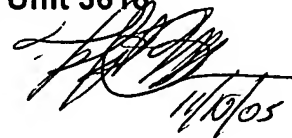
A response to this action should be mailed to:

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Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450,

Or faxed to:

PTO Central Fax: 571-273-8300

F. VANAMAN
Primary Examiner
Art Unit 3618



11/10/05